Amendments to the Specification:

Please replace the paragraph beginning at page 4, line 3, with the following rewritten paragraph:

--**Figure** **1** [[**1(a)**]] is a diagram of a basic spectrometer system **100** that can be used for metrology in accordance with various embodiments of the present invention. A feature **102,** such as a single line or grating structure on a semiconductor **104**, is positioned in the metrology device. A light source **106**, which can be any appropriate light or radiation source such as a broadband or polychromatic light source, can illuminate a spot on the structure. At least one optical element **108**, such as a focusing lens, focusing mirror, or narrowing aperture, can be placed in the path of the light beam in order to focus the light beam to a spot on the structure. A polarizing element **110**, such as a rotating polarizer, can be placed in the beam path between the focusing element and the structure in order to polarize the beam.--

Please replace the paragraph beginning at page 4, line 12, with the following rewritten paragraph:

--The light beam will reflect from the structure **102** and be directed toward a spectrometer **114**. An analyzer element **112**, such as a rotating analyzer, can be placed along the beam path between the structure and the spectrometer. The use of the analyzer and spectrometer allows for a detection and analysis of various spectral components of the reflected beam. The reflected beam intensities can be used in determining various parameter values for the structure, such as critical dimension, profile, index of refraction, extinction coefficient, and thickness values. In another embodiment, ~~shown in **Figure 1(b)**,~~ a spectrometer **116** can be positioned along a direction substantially orthogonal to the plane of the device **104**. In this case, the light reflected from the structure can be collected by lens **118** and directed to the spectrometer.--

Please replace the paragraph beginning at page 6, line 6, with the following rewritten paragraph:

--As can be seen from **Figure 3**, radiation such as UV light can be directed at a normal angle through the printed mask onto the photoresist layer in step **300** in order to expose the photoresist. The photoresist, or layer of photosensitive material, will experience a change in physical properties, such as the chemical resistance, of the areas selectively exposed to radiation of a specific wavelength. After the selective exposure of the photoresist, the next step **302** involves removing portions of the layer of photoresist. A developer solution can be applied to the photoresist layer after exposure, such that either the exposed or unexposed areas will be etched away, depending on the changes in chemical resistance discussed above. Optical metrology data, such as reflectometry/scatterometry data, can be taken after the exposure to UV light in step **300** and/or the removal of the photoresist (PR) layer in step **302**. Three-dimensional maps of the CD of the remaining areas of PR coating (CD_{PR}) **304**, as well as the thickness of the anti-reflection coating (t_{ARC}) **306**, can be obtained using optical reflectometry measurements as is known in the art. These values can be analyzed and retained for future comparison and/or correlation. Further, the measurement of these values can be simplified by the fact that the thickness of the oxide layer is already known and has been retained, such that the oxide thickness can be accurately accounted for in the three-dimensional maps. The next technological step **400** in the process, shown in **Figure 4**, involves an etching of the hard mask (HM) layer [[**300**]], which effectively transfers the pattern of the photoresist layer to the oxide layer using one of a number of etch processes as known in the art. The CD of the hard mask (CD_{HM}) **402** can be measured, analyzed, and retained. After the hard mask dimensions are measured, the underlying silicon can be etched **404**. Subsequent to the etching of the silicon, several important characteristics of the structure can be obtained through metrology measurements. These characteristics can include, for example, the critical dimension of the silicon (CD_{Si}) **406**, the thickness of the oxide layer (t_{Ox}) **408**, and the thickness of remaining Si layer (t_{Si}) **410**, as well as characteristics such as the index of refraction and extinction coefficient.--

Please replace the paragraph beginning at page 8, line 29, with the following rewritten paragraph:

--**Figure 5** is a schematic diagram of a processing tool arrangement **500** that can be used with a process such as described with respect to Figures 2-4. The diagram illustrates points in the process at which measurements such as critical dimension and thickness measurements can be made. Surface lithography can be performed in a single tool, a number of tools, or in a module of an IC fabrication process flow, which can include surface preparation and alignment steps in addition to the deposition, exposure, and development steps. Although a single metrology tool **502** is shown in the diagram, it should be understood that multiple optical measurement modules can be used either as part of a single tool or as a separate tools between process steps. A wafer prep station **504** is shown, which can include a number of tools for fabricating the silicon wafer and depositing additional layers, such as oxide and anti-reflective layers, as well as any other tools necessary for processes such as surface preparation and baking. After the wafer is prepared, or after any step in the preparation process if desired, the wafer can be transported to an optical metrology tool **502** such as a spectrometer described with respect to Figure 1. The metrology tool can be used to obtain an initial measurement of the thickness of the layers on the wafer, which can be retained for subsequent measurements. Typically, the wafer is transported to a wafer cassette after the wafer is prepped using a loading station **[[406]]** **506**, such that the wafer can be safely stored before subsequent processing. When the wafer is to be processed, the wafer can be transported to a photoresist station **[[408]]** **508**, which can apply a layer of photoresist to the surface of the wafer. The same tool, or a different tool of the photoresist station **[[408]]** **508**, can expose and develop the photoresist in order to transfer the pattern to the photoresist layer as a resist mask. One the resist mask is prepared, the wafer can be transferred to the next tool in the process, or to a metrology tool **502**, in order to obtain measurements such as the critical dimension of the photoresist and the thickness of the anti-reflection coating, or masking layer. The wafer then can be transferred to an etch chamber **[[410]]** **510** for etching the oxide layer. Once the pattern of the resist mask is etched into the oxide layer to create a hard mask, and typically after the residual resist mask has been removed, the wafer can be transferred to the next process tool or transferred to the ~~spectrometer 402~~ metrology tool **502**. In the metrology tool, measurements can be made which can be used to determine, for example, the critical dimension of the hard mask and the thickness of the etched

oxide layer. Since information about the thickness of the original oxide layer was obtained previously, the measurement of the critical dimension and determination of process effects on the thickness of the resultant hard mask can be much more accurate and quick to obtain than otherwise would be possible. The wafer then can be transferred to another etch station [[**412**]] **512**, or the same etch station in some embodiments, in order to etch the silicon. Once the pattern is etched into the silicon, the wafer can be transferred to the spectrometer in order to determine the critical dimension of the silicon, the thickness of the silicon, and the thickness of the residual oxide layer. The wafer then can be transferred back to the cassette loader station [[**406**]] **506** for storage in a wafer cassette or pod.--

Please replace the paragraph beginning at page 12, line 25, with the following rewritten paragraph:

--In another example, **Figure 7** shows the maturation **700** of a feature after subsequent steps in a fabrication process. After a first step, feature **702** has an underlying layer (stack) thickness t_1 and an overall feature thickness t_2, each of which can be determined using intensity information from an optical metrology process as described above. After a second process step, feature **704** has material deposited on the sidewalls and the underlying layers. A measurement of feature **704** would yield layer thickness t_3 and feature thickness t_4. As can be seen, t_3 is greater than t_1 as the overall layer thickness has increased, and t_4 is less than t_4 as the overall thickness of the feature has decreased. By retaining the thickness information from feature **702**, it can easily be determined that the apparent decrease in feature size is due to the increase in layer thickness, and not an erosion of feature thickness. Being able to use the feature thickness and layer thickness from feature **702** also can allow a number of variable parameters to be fixed when modeling the profile of feature [**604**] **704** in order to determine t_3 and t_4, thereby reducing the number of degrees of freedom in the model. Similarly, by retaining information from feature **704** it can be easier to determine the effects of the final process on feature **706**, such as the thickness of the layer deposited on the top of the feature actually adding more than might be apparent due to the increase in deposition thickness on the underlying layers (t_5 being greater than t_3).--